

Name: _____ Date: _____

Polynomial Factoring solution (version 614)

1. The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.

$$x^2 - 10x + 37 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(37)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 148}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-48}}{2}$$

$$x = \frac{10 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{10 \pm 4\sqrt{3}i}{2}$$

$$x = 5 \pm 2\sqrt{3}i$$

Notice that i is NOT under the square-root radical symbol!!

2. Express the product of $7 - 2i$ and $-5 + 9i$ in standard form $(a + bi)$.

Solution

$$\begin{aligned} & (7 - 2i) \cdot (-5 + 9i) \\ & -35 + 63i + 10i - 18i^2 \\ & -35 + 63i + 10i + 18 \\ & -35 + 18 + 63i + 10i \\ & -17 + 73i \end{aligned}$$

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3. Write function $f(x) = x^3 - 3x^2 - 22x + 24$ in factored form. I'll give you a hint: one factor is $(x - 1)$.

Solution

$$\begin{array}{c|cccc} & 1 & -3 & -22 & 24 \\ 1 & 1 & -2 & -24 & 0 \end{array}$$

$$f(x) = (x - 1)(x^2 - 2x - 24)$$

$$f(x) = (x - 1)(x - 6)(x + 4)$$

4. Polynomial p is defined below in factored form.

$$p(x) = -(x + 7) \cdot (x + 3)^2 \cdot (x - 1)^2$$

Sketch a graph of polynomial $y = p(x)$.

